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10/689,357	10/20/2003	L. Robert Deardurff	1-36728	4378

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EXAMINER	
DANIELS, MATTHEW J	
ART UNIT	**PAPER NUMBER**
1732	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/08/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/689,357	DEARDURFF, L. ROBERT	
	Examiner	Art Unit	
	Matthew J. Daniels	1732	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 November 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Rejections over Bright

1. **Claims 1-3 and 5-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Bright (USPN 4622001) in view of Hata (USPN 5411686). **As to Claim 1,** Bright teaches a process for preparing an article which could be used as a blow molding preform (entire document), comprising:

melting polymer in a plasticating extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (1:55-57);

cooling the polymer melt stream by heat exchange with a liquid heat transfer medium (2:1-15); and

forming the cooled polymer melt into a blow molding preform (2:6, the article of Bright is capable of being used as a blow molding preform).

Bright is silent to (a) flakes of polymer, (b) a screw extruder, and (c) cooling the melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature. However, these aspects would have been prima facie obvious for the following reasons:

(a) Hata teaches flakes (Fig. 16, Item 8), which is a well known method of delivering feedstock

(b) Hata teaches a screw extruder (Fig. 16), which is a well known method of melting and delivering polymer

(c) Bright teaches that the mold (Fig. 1, Item 50), and the nozzle leading to the mold (Fig. 3, Item 92), are each cooled with a heat transfer liquid being maintained at a temperature of less than 10 degrees C (1:63-68). Because the heat transfer liquid is at a temperature significantly lower than the melt, it is the Examiner's position that a temperature drop of at least 20 degrees Centigrade during flow of material *into and through* the cooled mold would have been an implicit aspect of Bright's invention.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hata into that of Bright because pellets or "flakes" would fit well into the hopper or feedstock inlet, and because Bright clearly suggests plasticating the mixture, which Hata's method would achieve. **As to Claims 2 and 3**, Bright teaches PET (1:55). **As to Claims 5 and 6**, Bright teaches above about 275 degrees C (1:57). **As to Claim 7**, Bright teaches a process for preparing an article which could be used as a blow molding preform (entire document), comprising:

melting polymer comprising polyethylene terephthalate (1:55), in a plasticating extruder to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (1:57-58), the temperature of the polymer melt at the discharge of the extruder being about 275 degrees C (1:57);

cooling the polymer melt stream by heat exchange with a liquid heat transfer medium (1:63-2:15); and

forming the cooled polymer melt into a blow molding preform (2:6, the article is inherently capable of being used as a blow molding preform).

Bright is silent to (a) flakes of polymer, (b) a screw extruder, and (c) cooling the melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature. However, these aspects would have been prima facie obvious for the following reasons:

(a) Hata teaches flakes (Fig. 16, Item 8), which is a well known method of delivering feedstock

(b) Hata teaches a screw extruder (Fig. 16), which is a well known method of melting and delivering polymer

(c) Bright teaches that the mold (Fig. 1, Item 50), and the nozzle leading to the mold (Fig. 3, Item 92), are each cooled with a heat transfer liquid being maintained at a temperature of less than 10 degrees C (1:63-68). Because the heat transfer liquid is at a temperature significantly lower than the melt, it is the Examiner's position that a temperature drop of at least 20 degrees Centigrade during flow of material *into and through* the cooled mold would have been an implicit aspect of Bright's invention.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hata into that of Bright because pellets or "flakes" would fit well into the hopper or feedstock inlet, and because Bright clearly suggests plasticating the mixture, which Hata's method would achieve. **As to Claim 8**, Bright teaches PET (1:55). **As to Claims 9**, Bright teaches above about 275 degrees C (1:57), which reads on the claimed temperature range. **As to Claim 10**, Bright teaches a process for preparing an article which could be used as a blow molding preform (entire document), comprising:

melting polymer comprising polyethylene terephthalate (1:55), in a plasticating extruder to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (1:57-58), the temperature of the polymer melt at the discharge of the extruder being about 275 degrees C (1:57);

cooling the polymer melt stream by heat exchange with a liquid heat transfer medium (1:63-2:15); and

forming the cooled polymer melt into a blow molding preform (2:6, the article is inherently capable of being used as a blow molding preform).

Bright is silent to (a) flakes of polymer, (b) a screw extruder, and (c) cooling the melt stream to a temperature at least 20 degrees Centigrade below the extruder discharge temperature. However, these aspects would have been prima facie obvious for the following reasons:

(a) Hata teaches flakes (Fig. 16, Item 8), which is a well known method of delivering feedstock

(b) Hata teaches a screw extruder (Fig. 16), which is a well known method of melting and delivering polymer

(c) Bright teaches that the mold (Fig. 1, Item 50), and the nozzle leading to the mold (Fig. 3, Item 92), are each cooled with a heat transfer liquid being maintained at a temperature of less than 10 degrees C (1:63-68). Because the heat transfer liquid is at a temperature significantly lower than the melt, it is the Examiner's position that a temperature drop of at least 20 degrees Centigrade during flow of material *into and through* the cooled mold would have been an implicit aspect of Bright's invention.

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hata into that of Bright because pellets or "flakes"

would fit well into the hopper or feedstock inlet, and because Bright clearly suggests plasticating the mixture, which Hata's method would achieve.

2. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Bright (USPN 4622001) in view of Hata (USPN 5411686) and further in view of Takahashi (USPN 6320014). Bright and Hata teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 4,** Bright appears to be silent to the claimed particle size. The Examiner asserts that in this case the size of the particle fed into a melt extruder does not materially affect the claimed process, and that any particle size would have been prima facie obvious to the ordinary artisan. However, Takahashi also teaches pellets having an average diameter of 5 mm comprising polyethylene terephthalate (10:10-15). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Takahashi into that of Bright in order to a) provide a dry feed line of material to an injection molding machine or extruder, b) provide pellets that are prevented from scorching, and c) to provide bottles of polyester having excellent properties such as high strength (All are found in Takahashi, 14: 49-62)).

Rejections over Belcher

3. Rejections set forth above are based on the Examiner's position that the claimed temperature drop is an implicit aspect of the method of Bright. However, if it is ultimately found that the claimed temperature drop cannot be considered to be an implicit aspect of that reference, then the following claim rejections are also believed to render the claimed invention prima facie obvious and are presented additionally in order to expedite prosecution:

4. **Claims 1-3 and 5-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Belcher (USPN 4988279) in view of Schwarzkopf (USPN 4642043). **As to Claim 1**, Belcher teaches a process for preparing a blow molding preform (4:16-27), comprising:

melting polymer flakes (12:20) in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at the discharge of the extruder (2:41 and 4:1-5);

cooling the polymer melt stream at least 20 degrees C (4:7-10 or 11:10-15); and

forming the cooled polymer melt into a blow molding preform (disclosure in 4:16-23 is interpreted to be a preform, or alternatively see 11:14-15).

In one interpretation, Belcher is silent to (a) cooling after discharging from the extruder, and (b) cooling with a liquid heat transfer medium. However, these aspects would have been prima facie obvious for the following reasons:

(a) The particular order of cooling and discharging does not distinguish the invention from Belcher, who teaches cooling then simultaneous discharging and forming of the polymer into a tubular preform. The same temperature drop is provided, the only difference between the claimed order of steps.

(b) Schwarzkopf provides a liquid heat transfer medium for use in "synthetic resin processing machines" (1:17).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Schwarzkopf into that of Belcher because doing so would adjust the temperature actively by cooling so as to better maintain the material within the optimal and narrow temperature range (2:11-20).

In an alternate interpretation of Belcher's method, Belcher provides cooling after discharging from the extruder with a liquid heat transfer medium (See 11:10-20 and item 60 in the figures), which would implicitly cool the "polymer melt stream" to a temperature at least 20 C below the extruder temperature and form a preform (11:14).

As to Claims 2 and 3, Belcher teaches PET (4:1-30). **As to Claims 5 and 6,** Belcher teaches 260-290 C (4:5). **As to Claim 7,** Belcher teaches a process for preparing a blow molding preform (4:16-27), comprising:

melting polymer flakes of PET (12:20) in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at a temperature of 260 C to 290 C (2:41 and 4:1-5);

cooling the polymer melt stream at least 20 degrees C (4:7-10); and

forming the cooled polymer melt into a blow molding preform (disclosure in 4:16-23 is interpreted to be a preform).

Belcher is silent to (a) cooling after discharging from the extruder, and (b) cooling with a liquid heat transfer medium. However, these aspects would have been prima facie obvious for the following reasons:

(a) The particular order of cooling and discharging does not distinguish the invention from Belcher, who teaches cooling then simultaneous discharging and forming of the polymer into a tubular preform. The same temperature drop is provided, the only difference between the claimed order of steps.

(b) Schwarzkopf provides a liquid heat transfer medium for use in "synthetic resin processing machines" (1:17).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Schwarzkopf into that of Belcher because doing so would adjust the temperature actively by cooling so as to better maintain the material within the optimal and narrow temperature range (2:11-20). **As to Claim 8**, Belcher teaches PET (4:1-30). **As to Claims 9**, Belcher teaches 260 to 290 C (4:5). **As to Claim 10**, Belcher teaches a process for preparing a blow molding preform (4:16-27), comprising:

melting polymer flakes of PET (12:20) in a plasticating screw extruder, to prepare a homogeneous stream of hot polymer melt at a temperature of 260 C to 290 C (2:41 and 4:1-5);

cooling the polymer melt stream at least 20 degrees C (4:7-10); and

forming the cooled polymer melt into a blow molding preform (disclosure in 4:16-23 is interpreted to be a preform).

Belcher is silent to (a) cooling after discharging from the extruder, and (b) cooling with a liquid heat transfer medium. However, these aspects would have been prima facie obvious for the following reasons:

(a) The particular order of cooling and discharging does not distinguish the invention from Belcher, who teaches cooling then simultaneous discharging and forming of the polymer into a tubular preform. The same temperature drop is provided.

(b) Schwarzkopf provides a liquid heat transfer medium for use in "synthetic resin processing machines" (1:17).

It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Schwarzkopf into that of Belcher because doing so

would adjust the temperature actively by cooling so as to better maintain the material within the optimal and narrow temperature range (2:11-20).

5. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Belcher (USPN 4988279) in view of Schwarzkopf (USPN 4642043) and further in view of Takahashi (USPN 6320014). Belcher and Schwarzkopf teach the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 4,** Belcher appears to be silent to the claimed particle size. The Examiner asserts that in this case the size of the particle fed into a melt extruder does not materially affect the claimed process, and that any particle size would have been prima facie obvious to the ordinary artisan. However, Takahashi also teaches pellets having an average diameter of 5 mm comprising polyethylene terephthalate (10:10-15). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Takahashi into that of Belcher in order to a) provide a dry feed line of material to an injection molding machine or extruder, b) provide pellets that are prevented from scorching, and c) to provide bottles of polyester having excellent properties such as high strength (All are found in Takahashi, 14: 49-62)).

Response to Arguments

6. Applicant's arguments filed 20 November 2006 have been fully considered but they are not persuasive. <u>The arguments appear to be on the following grounds</u>:

a) Bright discloses cooling the extruded polymer in only one location, namely in the mold. To suggest that Bright teaches cooling of a polymer melt by 20 C between the injection nozzle and

the injection mold is incredulous. Bright makes it clear that upon injection into the mold, the plastic is cooled very quickly to a temperature less than 100 C. Bright's mold is cooled by a liquid, and thermal isolation is achieved between the nozzle assembly and the adjacent molded article, providing a thermal break decreasing heat transmission between the heated nozzle and molded article.

b) Hata teaches that extruded polymer can be heated by a heater in a temperature adjusting portion before it is injected into a mold cavity where it is subsequently cooled.

c) Takahashi does no cure the deficiencies of Bright and Hata.

d) Belcher teaches a molten polymer conditioning process which takes place within the screw extruder where the temperature is reduced as the polymer moves toward the exit of the extruder without the use of a liquid heat transfer medium. Belcher does not suggest cooling the polymer stream to a temperature at least 20 C below the extruder discharge temperature. There is no suggestion of cooling with a liquid heat transfer medium. "In fact, there is no cooling at all after the discharge nozzle of the extruder, and certainly no teaching that the polymer discharged from the extruder must be cooled by at least 20°C by any means." (page 11, middle of page)

e) Schwarzkopf's purpose is to operate the nozzle "within narrow tolerances", thus heating or cooling occurs in the wall of the extruder nozzle, not between the nozzle and mold.

f) Takahashi does not cure the deficiencies of Belcher and Schwarzkopf.

7. These arguments are not persuasive for the following reasons:

a) Applicant concedes that Bright does cool the extruded polymer in the mold (page 7). However, Applicant's remarks appear to assert that the inventive cooling process occurs between

the injection nozzle and the injection mold, and that Bright lacks this aspect. Note, however, that the claims only require cooling after the extruder discharge and prior to "forming" the preform. Cooling of the melt during travel through the mold fulfills the claimed cooling because it occurs after the extruder discharge, but before solidification of the preform, which is interpreted to be "forming" the preform.

The Examiner's position in this regard will be that in view of the substantial difference between the molten polymer (275 C), the chilled heat transfer liquid flowing through the mold (10 C) and the stated objective of cooling the PET quickly (1:57-59), that the molten polymer of Bright would have cooled at least 20 C while flowing through the mold and prior to "forming" the preform. Note Bright's teaching that "The cavity member of the present invention achieves a quick heat transfer from the molten plastic to the cooling liquid, particularly in the region adjacent the nozzle and the gave of the cavity member..." (2:50-53). There is no evidence that this "quick heat transfer from the molten plastic to the cooling liquid" would produce a temperature change any less than 20 C.

Furthermore, by disclosing that the temperature of the cooling liquid should be selected (1:63-68) in order to produce this result ("quick heat transfer" at 2:51 and "avoid the range of maximum crystallite growth" at 1:60-61), Bright teaches that the degree and rate of cooling represents a result effective variable that should be optimized by cooling with the aid of a chilled heat transfer fluid of less than 16 C, preferably less than 10 C. The degree and rate of cooling therefore appear to represent result-effective variables, which are generally held to be obvious to the ordinary artisan.

b) Hata was relied upon for teachings about the conventional aspects of the feedstock and the extruder. However, note also that Applicant's remarks do not appear to consider the cold runner portion, item 5 in Fig. 15, in which the melt travels from the extruder (shown, for example, in Fig. 16) through a runner surrounded by coolant channels (items 4). Applicant's remarks appear to be drawn to the heating unit which precedes the cold runner portion, but do not appear to consider what effect would be achieved by the cold runner portion when operated in the usual manner.

c) The rejection over Takahashi has not been particularly argued.

d) The Examiner has set forth the position that the invention of Belcher, or Belcher in view of Schwarzkopf teaches all claimed limitations, the only difference being drawn to the particular order of cooling and extruding. In Belcher's method, extrusion, and preform formation are substantially simultaneous, and are preceded by cooling at least 20 C. In the absence of unexpected results, the Examiner asserts that this rearrangement of cooling and extruding to be prima facie obvious.

e) Schwarzkopf teaches that it is conventional to cool the wall of the extruder with a liquid coolant. In the combination, the only difference between the claimed method and the method disclosed by the references is the order of steps of cooling and extruding. However, in either case, the result would be the same or substantially the same. No unexpected results have been asserted to result from this difference in the order of steps.

f) The rejection over Takahashi has not been particularly argued.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 2/2/07

MJD

M. Eashoo

MARK EASHOO, PH.D
PRIMARY EXAMINER

03 | Feb | 07